# The birds of Uaso Narok Forest Reserve, Central Kenya

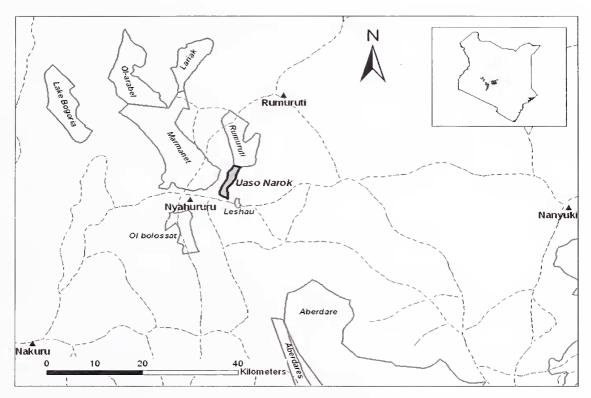
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## **Summary**

The birds of the Uaso Narok Forest, Central Kenya, were surveyed between June 2008 and April 2009. We recorded 161 species representing 49 families in total. Of these species, 34 were representative of the Afrotropical Highland Biome, representing 51% of all Kenyan species of this biome; two species were representative of the Somali-Masai biome. In addition to the Lesser Kestrel *Falco naumanni* (listed as Vulnerable in the IUCN Red List), there were 27 species of regional conservation concern. Breeding activity was recorded for 39 species, while a new population of Black-billed Weaver *Ploceus melanogaster* was discovered here, thus extending the species' known range. The main human activities recorded in this forest included firewood collection, illegal logging and charcoal burning. This survey revealed that Uaso Narok Forest is important for the conservation of Kenya's montane forest avifauna and deserves immediate official protection, as well as further biological research.

#### Introduction

Uaso Narok Forest Reserve (N 00° 02', E 036° 22') is located in West Laikipia District and lies northeast of Nyahururu Town (Fig. 1) on the eastern escarpment of the Rift Valley. At 1973 ha it is the smallest amongst the five constituent and almost continuous forest blocks forming the larger Marmanet Forests (Fig. 1): Marmanet (20,446 ha), Ol'Arabel (9629 ha), Lariak (4957 ha) and Rumuruti (6519 ha) (Anonymous 2008). These forests are a mixture of exotic plantations and indigenous forests. The forests are an important water catchment for four main rivers that drain into two Rift Valley Lakes and to a major swamp i.e. Sandai River (Lake Bogoria), rivers Ol'Arabel & Mukutan (Lake Baringo) and Ewaso Nyiro River (North) draining into Lorian Swamp (Anonymous 2008). Uaso Narok Forest falls within the Kenyan Mountain Endemic Bird Area (Stattersfield et al. 1998). It is worth noting that the drainage basins into which the above rivers flow are key national conservation areas hosting a diversity of scenic beauty, gallery riverine forests, and plant and animal diversity. Notable among these are Lake Bogoria, Samburu, Buffalo Springs and Shaba National Reserves as well as Lake Baringo, all designated as Important Bird Areas (Bennun & Njoroge 1999, 2001).



**Figure 1.** Location of Uaso Narok with respect to other forests of the Marmanet complex and neighbouring forests.

Uaso Narok Forest lies at an altitude ranging from 2200 m to 2450 m. Woody vegetation is dominated by trees such as Red Cedar *Juniperus procera*, Strangler Fig *Ficus thoningii*, East African Olive *Olea capensis* and Pillarwood *Cassipourea malosana*. There are also numerous herbs covering the forest floor and shrubs such as *Rhus natalensis* and *Scutia myrtina*. Scattered all over the forest are stumps of red cedar and olive, evidence of illegal logging which, alongside charcoal burning, are the main threats to avifauna. Some uses of the forest by the local community are licensed including harvesting of soil for tree nurseries, firewood collection and livestock grazing, but they are not well controlled or regulated. There is a need for long-term data on the status of bird species in the Uaso Narok Forest in order to assess the impact (if any) of these activities. This survey was designed as a starting point in order to collect baseline information on which future work can be planned and monitoring based on.

#### **Methods**

We systematically surveyed the birds of Uaso Narok Forest from June 2008 to December 2008, spending one week each month during this period. Sporadic birding visits to the forest were made between January and April 2009, which sometimes lasted only a few hours each month. During the intensive survey

period of 2008, we conducted various assessments of the bird communities as part of a broader exercise that assessed the avi-tourism potential for the area. Field surveys were coupled with training of nine bird guides from the local community, selected from around the forest reserve and the neighbouring Lake Ol'Bolossat Important Bird Area (Fig. 1). The locals were intensively trained in bird identification and professional guiding.

Two survey methods were used to assess the bird communities, namely general observations (through organised bird walks) and mist-netting. Bird walks involved splitting the group into two, each going in different directions using the existing forest trails. Additional observations were made while checking the mist nets and at the base camp. Mist netting is a suitable method for sampling skulking understorey species that may otherwise be overlooked (Gibbons et al. 1996). We ringed for two mornings during each fieldwork period, employing 90 meters of mistnet operated for 6 hours per day (06:30-12:30), producing a total of 540 metre-net-hours per monthly session and 3780 meter-net-hours over the entire study period. Nets were moved to a different micro-habitat during each session in order to maximise the species caught at different sites that included forest interior, forest edge and bush-scrub. All birds caught in the nets were ringed using uniquely numbered aluminium metal rings from the East African Ringing Scheme. Standard morphological measurements were taken in addition to assessments of moult status and brood patch. Ageing of birds followed Jackson (2001), while identification and taxonomy followed Zimmermann et al. (1996) and Ornithological Subcommittee (2009), respectively.

The forest-dependent characteristics of all species observed were determined following Bennun *et al.* (1996) where forest specialists (FF) are species that are dependent on an undisturbed and intact indigenous forest structure and are the true forest birds, indicative of a healthy forest; forest generalists may occur in undisturbed forests but are able to exist in modified and fragmented forests, while forest visitors (f) occur in forests but are typical of other habitats.

Breeding activities were recorded opportunistically. Breeding was inferred from observations of at least one of the following: (i) an active nest, i.e., contents seen, (ii) young seen accompanying adult and begging for food, (iii) brood patch observed in captured individuals, (iv) adult seen carrying food or nesting material to unknown nest, young or mate, and (v) juveniles, immature and sub-adults observed and/or captured.

#### Results

# Mistnetting

Three hundred and seventy-eight (378) individuals representing 53 bird species were captured from the six netting locations that we set up across

the study area. Only four individuals were recaptured; three of them were recaptured at the same net positions as the original capture, while a Yellow-whiskered Greenbul *Andropadus latirostris* was recaptured approximately 300 m from the initial capture site. Sampling effort was evenly distributed across forest interior, forest edge and bush-scrub habitats, with the latter two producing most of the birds caught (87 %). The majority of the birds captured (85 %) were adults; 9 % were sub-adults/full-grown, 2 % immature and 4 % juvenile. The Yellow-whiskered Greenbul was the commonest bird caught in nets, accounting for almost 16 % of all captures (Fig. 2).

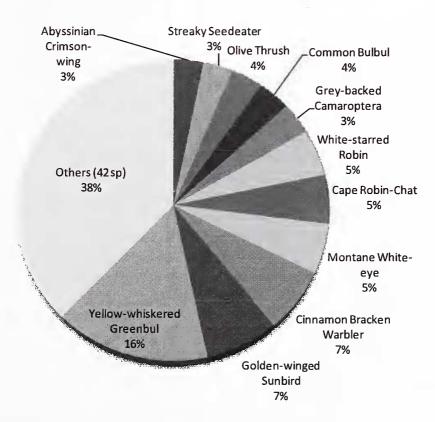


Figure 2. Most common birds captured in mist nets.

# Species Richness and Composition

One hundred and sixty-one (161) species from 59 families were recorded during the entire sampling period. This included 12 species that are new for the Quarter Square Degree 50c (Lewis & Pomeroy 1989) bringing the total QSD's list to 532 species. In addition, 16 species listed in East Africa's Regional Red Data List (Bennun & Njoroge 1996) were recorded (Table 1). The forest dependency analysis revealed that 21 species were forest specialists (FF), 37 (24 %) were forest generalists (F) while 39 were forest visitors (f) (Appendix 1).

Table 1. Species observed in Uaso Narok Forest that are listed in East Africa's Regional Red Data List.

Common Name	Scientific Name	Red List Category
African Black Duck	Anas sparsa	Regionally Near-threatened
Giant Kingfisher	Megaceryle maxima	Regionally Near-threatened
Lesser Kestrel	Falco naumanni	Vulnerable
Crowned Eagle	Stephanoaetus coronatus	Regionally Threatened
Red-throated Wryneck	Jynx ruficollis	Regionally Near-threatened
Cinnamon-chested Bee-eater	Merops oreobates	Regional Responsibility
Moustached Tinkerbird	Pogoniulus leucomystax	Regional Responsibility
White-eyed Slaty Flycatcher	Melaenornis fischeri	Regional Responsibility
Hunter's Cisticola	Cisticola hunteri	Regional Responsibility
Chestnut-throated Apalis	Apalis porphyrolaema	Regional Responsibility
Hunter's Cisticola	Cisticola hunteri	Regional Responsibility
Grey-capped Warbler	Eminia lepida	Regional Responsibility
Mountain Yellow Warbler	Chloropeta similis	Regional Responsibility
Eastern Double-collared Sunbird	Cinnyris mediocris	Regional Responsibility
Kenya Rufous Sparrow	Passer rufocinctus	Regional Responsibility
Black-billed Weaver Golden-winged Sunbird	Ploceus melanogaster Drepanorhynchus reichenowi	Least Concern Regional Responsibility

## Breeding records

Thirty-nine (24 %) of these species were confirmed as breeding in the forest reserve during the period of this study. The majority of records were between November and December. The following list shows the species, type of breeding record, and age and dates of observations. Observations include records in the immediate neighbourhood of the forest as long as these species were also recorded in the forest.

*Key to abbreviations used*: Ad - Adult; SAd - Sub-adult; Imm - immature; Juv - juvenile; ♂ - male; ♀ - female; BP - brood patch

Helmeted Guineafowl Numida meleagris - nest observed with 7 eggs at AIC compound by the forest edge 18 December 2008. Red-eyed Dove Streptopelia semitorquata - Ad sitting on 2 eggs 17 December 2008. Hartlaub's Turaco Tauraco hartlaubi - pair seen building nest among a dense climber entangling a tree canopy 8-10m high, 4 December 2008. Narina Trogon Apaloderma narina – Imm of observed in the forest interior, early January 2009. Yellow-rumped Tinkerbird Pogoniulus bilineatus - Ad BP 1 ringed 4 November 2008. Yellow-whiskered Greenbul Andropadus latirostris - Juv ringed 26.8.08; SAd ringed 26 June 2008; 3 SAd ringed 5 November 2008, 3 Imm ringed 30 December 2008, 18 September 2008 and 6 December 2008. Common Bulbul Pycnonotus barbatus - 2 Ads ringed BP 3 on 5 November 2008 and 6 December 2008; nest with 2 pullus at AIC on the forest edge 19 December 2008. White-starred Robin Pogonocichla stellata - 2 Juv observed in the forest Jun-Oct; 2 SAd ringed 23-24 August 2008; SAd ringed 6 December 2008. Cape Robin Chat Cossypha caffra - SAd ringed 26 June 2008; 2 Juv ringed 26 June 2008; Ad BP 2 26 June 2008; SAd ringed 31 July 2008. Olive Thrush Turdus olivaceus - SAd ringed 23 August 2008; 3 Ads BP 3 on 4-5 November 2008; Ad incubating

17 December 2008; Ad actively nest building at AIC 18 December 2008. African Dusky Flycatcher Muscicapa adusta - 2 Juv observed in June 2008; SAd ringed 26 August 2008; Juv observed 17 December 2008. White-eyed Slaty Flycatcher Melaenornis fischeri – Juv ringed 26 June 2008; SAd ringed 23 August 2008. Brown Woodland Warbler Phylloscopus umbrovirens - Ad BP 3 ringed 29 October 2008. Cinnamon Bracken Warbler Bradypterus cinnamomeus - SAd ringed 30 July 2008; Ad BP 2 5 December 2008; Juv ringed 6 December 2008. Hunter's Cisticola Cisticola hunteri – 2 Ads both with BP 3 ringed at AIC 15 December 2008, their nest had 3 eggs. Montane White-eye Zosterops poliogaster - 2 Ads BP 1 and 2 on 30 October 2008; Ad BP 3 ringed 5 November 2008. Common Fiscal Lanius collaris - SAd ringed 23 August 2008; Ad feeding Juv 15 February 2009; Ad feeding at nest AIC February 2009. Tropical Boubou Laniarius aethiopicus - Ad BP 3 ringed 5 December 2008. Grey Cuckooshrike Coracina caesia - Juv seen following Ad and begging for food inside the forest close to fire tower 13 April 2009. Slender-billed Starling Onychognathus tenuirostris - 2 Ads (probably a pair) seen taking nesting material to a hole nest on a Red Cedar Juniperus procera on 17 December 2008. Superb Starling Lamprotornis superbus - 2 Imm feeding among Ads flock near forest station Dec. 2008, young birds observed at town sewage ponds same period. Sharpe's Starling Cinnyricinclus sharpie - Imm & ringed 5 December 2008; Pair seen entering hole nest on a dry but standing Red Cedar 17 December 2008 at gorge's edge near waterfalls. Amethyst Sunbird Nectarinia amethystina – SAd ♀ ringed 5 November 2008. Northern Double-collared Sunbird Cinnyris reichenowi - pair seen attending to a nest with both food and nesting materials near waterfall on the gorge's edge 17 December 2008. Eastern Double-collared Sunbird C. mediocris - 2 Imm of ringed 4-5 November 2008; Ads entering nest near falls 17 December 2008. Golden-winged Sunbird D. reichenowi - SAd ♂ ringed 4 November 2008; SAd ♀ ringed 4 November 2008; Ad ♀ BP 1 4 November 2008; 2 pairs attending nest near falls 17 December 2008. Malachite Sunbird N. famosa - Imm ringed 26 June 2008. Kenya Rufous Sparrow Passer motitensis - pair actively building nest near the forest station in December 2008. Grosbeak Weaver Amblyospiza albifrons - pair building a nest in the papyrus swamp near the falls' footbridge 17 December 2008. Baglafecht Weaver Ploceus baglafecht - 2 Juv ringed 4-5 November 2008. Black-billed Weaver P. melanogaster - pair building nest on the tip of Scutia myrtina (family Rhamnaceae) shrub at altitude 2349m 27 October 2008. Abyssinian Crimsonwing Cryptospiza salvadorii - Imm ringed 18 September 2008; 3 Juv & ringed 5 November 2008. Redcheeked Cordon-bleu Uraeginthus bengalus - Ad incubating (contents not seen), Dec 2008. Bronze Mannikin Lonchura cucullata - 3 Juv ringed 4-5 November 2008. Black-and-white Mannikin L. bicolour - Ad with nesting materials attending nest; Juv observed in the field Nov-Dec 2008. Pintailed Whydah Vidua macroura - Imm & ringed 5 November 2008. Streaky Seedeater Serinus striolatus - 2 Ads BP 3 on 5th and 15th November 2008; 2

Ads BP 2 at AIC 15 December 2008. **Thick-billed Seedeater** *S. burtoni* – SAd ringed 30 July 2008; 2 SAd ringed 17 September 2008; Ad BP 2 on 4 November 2008; Ad BP 3 on 5 November 2008.

#### Discussion and Conclusion

The avifauna of Uaso Narok Forest demonstrates a strong resemblance to the (not-too-distant) mountain forests of the Aberdares and Mt. Kenya. This is not surprising because of the 161 species recorded at Uaso Narok, 34 were characteristic of the Afrotropical highland biome, which represents 51 % of all Kenyan species from this biome (see Bennun & Njoroge 1999, 2001). Albeit lower than the number recorded in the Aberdares (n = 52) and Mt. Kenya (n = 53) (Bennun & Njoroge 1999, 2001), these two forests are much larger than the Uaso Narok.

Marmanet complex including Uaso Narok has not been spared from the indigenous forests' destruction that has been ongoing in many parts of the country (e.g., KIFCON 1992, Anonymous 2008). Furthermore, as the population of communities living adjacent to forest continues to increase, the forest birds come under increasing threat due to intensified human activities. The presence of a large number of remnant stumps of brown olive and red cedar over most of the forest testifies that it has suffered destruction in the past. The illegal activities observed during the study such as charcoal burning and logging place further pressure on the forest resources. Communities living around the reserve should not only be encouraged to plant on-farm woodlots, but facilitated to do so in order to ease pressure on the forest. Alternatively, regulated buffer zones in other larger blocks of Marmanet (Fig. 1) could be considered with woodlots for fuel supplementation as suggested by Cordeiro & Githiru (2000) for woodlands and mixed dry forests in northeast Tanzania.

Further research should not only focus on building upon this species list, but also assessing the relative abundance of species as well as finer scale analysis including the variation in feeding guild structure between different habitats. Such studies will require an even distribution of effort across all the forest blocks depending on the sizes and habitat types to allow comparisons e.g. species diversity and density. More (monitoring) data are also needed for selected forest specialist bird species that could act as indicators of the state of these forests. Lastly, conservation planning for these forests would also benefit from detailed ecological studies of particular species and their habitat requirements.

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used: AftH- Afrotropical Highland Biome species; QSD- Quarter Square Degree; FF- Forest specialist; F- Forest generalist; f- Forest Appendix 1. Complete list of the birds and their status recorded at Uaso Narok Forest Reserve during 2008-2009. Abbreviations visitor; AM- Afrotropical Migrant; PM- Palaearctic Migrant. When these letters are in lower case, migrants of that category may occur alongside resident, non-migratory individuals of one of the other migrant categories.

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)	Common Name	Helmeted Guineafowl	Scaly Francolin	Common Quail	Harlequin Quail	Egyptian Goose	African Black Duck	Yellow-billed Duck	Marabou Stork	Hadada Ibis	Black-headed Heron	Hamerkop	Lesser Kestrel	Black Kite	Black-chested Snake Eagle	African Harrier Hawk	African Goshawk	Little Sparrowhawk	Rufous-breasted Sparrowhawk	Great Sparrowhawk	Mountain Buzzard	Augur Buzzard	Long-crested Eagle	Crowned Eagle

Common Name Scientific Name Forest Category	Black Crake Amaurornis flavirostris	Common Moorhen Gallinula chloropus		African Green Pigeon Treron calva F	Speckled Pigeon Columba guinea	eon Columba arquatrix	8	Red-eyed Dove Streptopelia semitorquata f	ve Streptopelia capicola	Poicephalus gulielmi	Hartlaub's Turaco Tauraco hartlaubi FF	Red-chested Cuckoo Cuculus solitarius F	African Emerald Cuckoo Chrysococcyx cupreus F	Klaas's Cuckoo Chrysococcyx klaas	Diederik Cuckoo		African Wood Owl Ciccaba woodfordii F	htjar Caprimulgus poliocephalus	Mottled Swift Apus aequatorialis	Nyanza Swift Apus niansae	Little Swift Apus affinis	Speckled Mousebird Colius striatus	Narina Trogon Apaloderma narina F	Malachite Kingfisher Alcedo cristata	Giant Kingfisher Megaceryle maxima	Pied Kingfisher Ceryle rudis	Eurasian Bee-eater f	
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Scientific Name	Psalidoprocne holomelas Riparia paludicola Riparia cincta	Hirundo rustica	Hirundo fuligula Hirundo daurica	Cisticola hunteri	Phyllolais pulchella Apalis flavida	Apalis porphyrolaema	Apalis cinerea	Eminia lepida	Camaroptera brachyura	Pycnonotus barbatus	Andropadus nigriceps	Andropadus latirostris	Phyllastrephus cabanisi	Bradypterus baboecala	Bradypterus cinnamomeus	Acrocephalus gracilirostris	Chloropeta natalensis	Chloropeta similis	Phylloscopus umbrovirens	Phylloscopus trochilus	Sylvia atricapilla	Sylvia borin	Pseudoalcippe abyssinica	Zosterops poliogaster
Common Name	Black Saw-wing Plain Martin Banded Martin	Barn Swallow	Rock Martin Red-rumped Swallow	Hunter's Cisticola	Buff-bellied Warbler Yellow-breasted Apalis	Chestnut-throated Apalis	Grey Apalis	Grey-capped Warbler	Grey-backed Camaroptera	Common Bulbul	Mountain Greenbul	Yellow-whiskered Greenbul	Cabanis's Greenbul	Little Rush Warbler	Cinnamon Bracken Warbler	Lesser Swamp Warbler	Dark-capped Yellow Warbler	Mountain Yellow Warbler	Brown Woodland Warbler	Willow Warbler	Blackcap	Garden Warbler	African Hill Babbler	Montane White-eye

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	Scientific Name	Lamprotornis chalybaeus	Lamprotornis superbus	Onychognathus morio	Onychognathus walleri	Onychognathus tenuirostris	Cinnyricinclus sharpii	Turdus olivaceus	Pogonocichla stellata	Cossypha caffra	Saxicola torquatus	Myrmecocichla aethiops	Monticola rufocinereus	Melaenomis fischeri	Bradornis microrhynchus	Muscicapa adusta	Anthreptes collaris	Nectarinia olivacea	Nectarinia amethystina	Nectarinia tacazze	Nectarinia kilimensis	Nectarinia famosa	Nectarinia reichenowi	Cinnyris reichenowi	Cinnyris mediocris	Nectarinia venusta	Passer rufocinctus	Passer griseus	Amblyospiza albifrons
	Common Name	Greater Blue-eared Starling	Superb Starling	Red-winged Starling	Waller's Starling	Slender-billed Starling	Sharpe's Starling	Olive Thrush	White-starred Robin	Cape Robin Chat	Common Stonechat	Northern Anteater Chat	Little Rock Thrush	White-eyed Slaty Flycatcher	African Grey Flycatcher	African Dusky Flycatcher	Collared Sunbird	Olive Sunbird	Amethyst Sunbird	Tacazze Sunbird	Bronze Sunbird	Malachite Sunbird	Golden-winged Sunbird	Northern Double-collared Sunbird	Eastern Double-collared Sunbird	Variable Sunbird	Kenya Rufous Sparrow	Grey-headed Sparrow	Grosbeak Weaver

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Scientific Name	Ploceus baglafect	Ploceus melanogaster	Ploceus spekei	Ploceus rubiginosus	Ploceus insignis	Euplectes capensis	Nigrita canicapilla	Cryptospiza salvadorii	Coccopygia quartinia	Estrilda astrild	Uraeginthus bengalus	Uraeginthus ianthinogaster	Lagonosticta senegala	Lonchura cucullata	Lonchura bicolor	Vidua macroura	Motacilla flava	Motacilla capensis	Motacilla aguimp	Motacilla clara	Anthus trivialis	Serinus citrinelloides	Serinus reichenowi	Serinus sulphuratus	Serinus striolatus	Serinus burtoni	
Common Name	Baglafecht Weaver	Black-billed Weaver	Speke's Weaver	Chestnut Weaver	Brown-capped Weaver	Yellow Bishop	Grey-headed Negrofinch	Abyssinian Crimsonwing	Yellow-bellied Waxbill	Common Waxbill	Red-cheeked Cordon-bleu	Purple Grenadier	Red-billed Firefinch	Bronze Mannikin	Black-and-white Mannikin	Pin-tailed Whydah	Yellow Wagtail	Cape Wagtail	African Pied Wagtail	Mountain Wagtail	Tree Pipit	African Citril	Reichenow's Seedeater	Brimstone Canary	Streaky Seedeater	Thick-billed Seedeater	